

**CLAIMS**

We claim:

- 5        1.        A ballistics calculator system for computing targeting information to hit a target, comprising a processor, said processor comprising:  
a ballistics computer program for analyzing information needed to accurately aim  
a firearm at a target using a target acquisition device with a reticle, said program  
using information regarding one or more of:
- 10            a)        external conditions;  
              b)        the firearm being used;  
              c)        the projectile being used;  
              d)        the target acquisition device and reticle being used;  
              e)        the shooter; and
- 15            f)        the relation of the shooter and the target, wherein said target can be  
greater than 1000 yards from the shooter.
2.        The ballistics calculator system of claim 1, wherein said information  
regarding external conditions is selected from one or more of date, time, temperature,  
20        barometric pressure, relative humidity, target image resolution, wind-speed, wind  
direction, hemisphere, latitude, longitude and altitude.

3. The ballistics calculator system of claim 2, wherein at least some of said information regarding external conditions is input to the program using an automated measuring device operably linked to the said processor.

5 4. The ballistics calculator system of claim 1, wherein said information regarding the firearm being used is selected from one or more of the rate and direction of the barrel twist, barrel length, internal barrel caliber and internal barrel diameter.

5. The ballistics calculator system of claim 1, wherein said ballistics computer  
10 program includes automatic input of firearm information by selecting stored rate and direction of barrel twist, barrel length, internal barrel caliber, and internal barrel diameter.

6. The ballistics calculator system of claim 1, wherein said information regarding the projectile being used is selected from one or more of projectile weight, projectile caliber,  
15 projectile configuration, propellant type, propellant amount, propellant potential force, powder, primer, one or more ballistic coefficients of the projectile, and the muzzle velocity of the projectile.

7. The ballistics calculator system of claim 5, wherein said ballistics computer  
20 program includes automatic input of projectile information by selecting stored projectile information.

8. The ballistics calculator system of claim 1, wherein said information regarding the target acquisition device and reticle being used is selected from one or more of type of reticle, power of magnification, plane of function, the positional relationship between the target acquisition device and the firearm, and the range at which the said target acquisition device was zeroed using said firearm and said projectile.
9. The ballistics calculator system of claim 1, wherein said information regarding the shooter is selected from one or more of the shooter's heart rate and rhythm, visual acuity, visual idiosyncrasies, respiratory rate, blood oxygen saturation, muscle activity, brain wave activity, and number and positional coordinates of spotters assisting the shooter.
10. The ballistics calculator system of claim 1, wherein said information regarding the relation between the shooter and target is selected from one or more of the distance between the shooter and target, the speed and direction of movement of the target relative to the shooter, the angle formed between the barrel and an axis perpendicular to the force of gravity, and the direction of fire from true North.
11. The ballistics calculator system of claim 10, wherein said distance between the shooter and the target is less than 100 yards.
12. The ballistics calculator system of 10, wherein said distance between the shooter and target is greater than 100 yards.

13. The ballistics calculator of claim 10, wherein said distance between the shooter and target is greater than 500 yards.
- 5 14. The ballistics calculator of claim 10, wherein said distance between the shooter and target is greater than 1000 yards.
15. The ballistics calculator of claim 10, wherein said distance between the shooter and target is greater than 1500 yards.
- 10 16. The ballistics calculator system of claim 1, wherein said target acquisition device reticle comprises an aiming point at an intersection of a primary vertical cross-hair and a primary horizontal cross-hair, wherein said ballistics calculator system further provides an output of the number of clicks an elevation knob and a windage knob should be turned to adjust a position of said target acquisition device relative to a firearm such that an intersection of said primary vertical cross-hair and said primary horizontal cross-hair can be used as the aiming point for striking said target.
- 15 17. A reticle, comprising:
- 20 a) a primary vertical cross-hair and a primary horizontal cross-hair;
- b) a plurality of secondary horizontal cross-hairs at a predetermined distance along said primary vertical cross-hair; and

c) a plurality of secondary vertical cross-hairs at a predetermined distance along at least some of said secondary horizontal cross-hairs.

5 18. The reticle of claim 17, wherein the said primary vertical and horizontal cross-hairs intersect at the optical center of the said reticle.

19. The reticle of claim 17, wherein the said primary vertical and horizontal cross-hairs intersect above the optical center of the said reticle.

10 20. The reticle of claim 17, wherein the said primary vertical and horizontal cross-hairs intersect below the optical center of said reticle.

21. The reticle of claim 17, wherein at least some of said secondary horizontal cross-hairs are evenly spaced.

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22. The reticle of claim 17, wherein at least some of said secondary vertical cross-hairs are evenly spaced.

20 23. The reticle of claim 17, wherein at least some of said secondary horizontal and vertical cross-hairs have identifying marks.

24. The reticle of claim 17, wherein said vertical and horizontal cross-hairs are

connected to form a grid.

25. The reticle of claim 17, wherein said reticle includes range finding markings on said reticle.

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26. A target acquisition device, comprising:

- a) a housing;
- b) a means for mounting the housing in a fixed, predetermined position relative to a firearm;
- 10 c) an objective lens mounted in one end of the housing;
- d) an ocular lens mounted in the opposite end of the housing; and
- e) a reticle, comprising:
  - 1) a primary vertical cross-hair and a primary horizontal cross-hair;
  - 15 2) a plurality of secondary horizontal cross-hairs at a predetermined distance along said primary vertical cross-hair; and
  - 3) a plurality of secondary vertical cross-hairs at a predetermined distance along at least some of said
  - 20 secondary horizontal cross-hairs.

27. The ballistics calculator system of claim 1, wherein said type of target acquisition

device reticle comprises:

- a) a reticle, comprising:
  - 1) a primary vertical cross-hair and a primary horizontal cross-hair;
  - 5 2) a plurality of secondary horizontal cross-hairs at a predetermined distance along said primary vertical cross-hair;
  - 3) a plurality of secondary vertical cross-hairs at a predetermined distance along at least some of said secondary horizontal cross-
  - 10 hairs; and
- b) an output using said horizontal cross-hairs and said secondary vertical cross-hairs to identify an aiming point for hitting the target.

28. The ballistics calculator system of claim 1, wherein said processor is further  
15 configured to display information on a display screen.

29. The ballistics calculator system of claim 28, wherein the information displayed is an image of a reticle on said display screen showing a position of said aiming point.

20 30. The ballistics calculator system of claim 28, wherein the information displayed is a projected image on a reticle showing a position of said aiming point.

31. The ballistics calculator system of claim 28, wherein the information displayed is a virtual image on a reticle showing a position of said aiming point.
32. A method for using a ballistics calculator system, comprising:
- 5 a) providing the ballistics calculator system of claim 1;
- b) inputting information regarding one or more of external conditions, the firearm being used, the projectile being used, the target acquisition device and reticle being used, the shooter, and the relation of the shooter to the target;
- c) selecting one or more aiming points on said ballistics calculator system;
- 10 and
- d) using the aiming point information displayed by the said ballistics calculator system to aim the firearm so as to hit the target.
33. A method for shooting a target, comprising:
- 15 a) A target acquisition device, comprising:
- 1) a housing;
- 2) a means for mounting the housing in a fixed, predetermined position relative to a firearm;
- 3) an objective lens mounted in one end of the housing;
- 20 4) an ocular lens mounted in the opposite end of the housing;
- 5) a reticle, comprising:
- i. a primary vertical cross-hair and a primary horizontal cross-



hair;

ii. a plurality of secondary horizontal cross-hairs at a predetermined distance along said primary vertical cross-hair;

5 iii. a plurality of secondary vertical cross-hairs at a predetermined distance along at least some of said secondary horizontal cross-hairs;

b) the ballistics calculator system of claim 1;

c) selecting an aiming point that accounts for the relation of the shooter to the target; and

10 d) using the aiming point information displayed by the said ballistics calculator system to aim the firearm so as to hit the target.

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